Author Index to Volume 40

References with (A) are abstracts of papers presented at meetings of the Optical Society of America; (T) designates title only; (L) designates Letters to the Editor.

Adams, Kenneth B. (see Burns, Keivin)—339
Adcock, W. A. (see Hornig, D. F.)—497
Aicher, J. O. Measurement of 1849A radiation by afterglow of manganese-activated calcium silicate—805(A)
Allen, Ralph G. (see Coleman, Howard S.)—261(A)
Alpern, Mathew. Effect of luminance, exposure asynchrony, and spatial separation of stimuli on the magnitude of metacontrast—796(A)
Anderson, Charles H. (see Fassel, Velmer A.)—803(A)/742
Anslow, Gladys A. and Ruth C. Shea. Ultraviolet dissociation spectra of Nylons—262(A)
Arroe, O. H. and J. E. Mack. Hollow-cathode source design for high resolution spectroscopic studies with small samples —386
Archer, James E. (see Harrison, George R.)—259(A)
Aschenbrenner, Claus M. Workshop method of figuring concave mirrors by quantitative Foucault tests—258(A)

Babcock, Horace W. An integrating photometer for low light levels—409
Back, Frank G. Lens tester—257(A)
Baird, Walter S. Recording grating monochromator for the range 180 to 4000 millimicrons—259(A)
Ballard, Stanley S. (see Combes, Lewis S.)—256(A)
—— (see McCarthy, Kathryn A.)—256(A)
——, **Lewis S. Combes, and Kathryn A. McCarthy.** Gross variations in the optical, mechanical, and thermal properties of synthetic crystalline lithium fluoride—798(A)
Barnes, R. Bowling. Book review of *Infrared Determination of Organic Structures* by H. M. Randall, R. G. Fowler, Nelson Fuson, and R. J. Dangl—252
Bass, Arnold M. and H. Sponer. Fluorescence studies of some simple benzene derivatives in the near ultraviolet. I. Fluorobenzene and chlorobenzene—389
Baum, William A. and Lawrence Dunkelman. Ultraviolet radiation of the high pressure xenon arc—782
Bauple, R., A. Gilles, J. Romand, and B. Vodar. Absorption spectra of samples of quartz and corundum in ultraviolet. Electric and thermic treatment of quartz—788(L)
Beasley, John K. (see Harris, Louis)—801(A)
Beeching, R. *Electron Diffraction* (Book). Reviewed by J. Rand McNally, Jr.—477
Belknap, Marion A. (see Gibson, Kasson S.)—435
Benford, James R. and Richard L. Seidenberg. Phase contrast microscopy for opaque specimens—259(A)/314
Benson, Nels C., Georg Hass, and Noel W. Scott. 72-inch high vacuum evaporator and its glow discharge equipment —687
Berl, Walter G. *Physical Methods in Chemical Analysis* (Book) Reviewed by Philip J. Elving—792
Berry, Chester R. Growth of silver filaments and dendrites—615
Bersis, D. S. Two infra-red sensitive SrS phosphors with Zn dominant activator—335(L)
Billings, B. H. Birefringent frustrated total reflection filter—471
——, **S. Sage, and W. Draisin.** One-angstrom pass-band polarization interference filter—262(A)
Bingley, F. J. Application of projective geometry to the theory of color mixture—264(A)
Bird, G. (see Land, E. H.)—61
Bird, George R. (see Blout, Elkan R.)—304
Birren, Faber. *Color Psychology and Color Therapy* (Book). Reviewed by Ralph M. Evans—696
Blank, John M. Interferometric measurements of wavelengths in the spectrum of mercury isotope 198—345
Blout, Elkan R., George R. Bird, and David S. Grey. Infra-red microspectroscopy—304
——, **Richard S. Corley, and Patricia L. Snow.** Infra-red transmitting filters. II. The region 1 to 6μ—415
Bouman, M. A. Peripheral contrast thresholds of the human eye—825
—— **and H. A. van der Velden.** Ricco's law and the quanta-explanation of vision—336(L)
Bowen, John H. (see Harvalic, Zaboj V.)—755
Bozman, W. R. (see Meggers, W. F.)—262(A)
Brauer, Peter. Rise in brightness of infra-red sensitive phosphors—353
Brice, Arthur T. (see Saylor, Charles Proffer)—329
Brice, B. A., M. Halwer, and R. Speiser. Photoelectric light-scattering photometer for determining high molecular weights—768
Britton, William C. (see Watson, John T.)—258(A)
Brode, Wallace R. Book review of *Elementary Photography* by Gilford G. Quarles—620
—— Book review of *Fluorescence and Phosphorescence* by Peter Pringsheim—545
—— Book review of *An Introduction to Luminescence of Solids* by H. W. Leverenz—406
—— Book review of *Introduction to Theoretical and Experimental Optics* by Joseph Valasek—182
—— Book review of *Manual of Spectroscopy* by Theodore A. Cutting—181
—— Book review of *Manual of Standardized Procedures for Spectrophotometric Chemistry* by Harold J. Fister—880
—— Book review of *Optics (Volume III of Principles of Physics Series)* by Francis W. Sears—252
—— Book review of *Quantitative Ultramicroanalysis* by Paul L. Kirk—620
—— Book review of *Spectrochemical Procedures* by Charles E. Harvey—696
Broida, H. P. (see Oldenberg, O.)—381
Brown, F. W. (see Greenfield, M. A.)—643
Brown, W. R. J. Effect of chromatic surrounding fields on color discrimination—797(A)
Brumley, Corwin H. and David Richardson. Electro-optic crystal interferometer—800(A)
Bube, Richard H. Luminescence and trapping in zinc-sulfide-type phosphors—260(A)
Buc, G. L. and E. I. Sterns. Transmittance of interference filters—336(L)
Bullock, B. W. and S. Silverman. Rapid scanning spectrometer for oscillographic presentation in the near infra-red—257(A)/608
Burns, Keivin, Kenneth B. Adams, and Jean Longwell. Interference measurements in the spectra of neon and natural mercury—339

Cady, W. M. (see Gordon, G.)—852
Callahan, Francis P., Jr. Application of Bouguer's law to non-uniform films—263(A)
Camus, Jean (see Harrison, George R.)—800(A)
Carpenter, Robert O'B. Electro-optic effect in uniaxial crystals of the dihydrogen phosphate type. III. Measurement of coefficients—225
—— Induced birefringence of ADP and KDP as a function of temperature—798(A)
Carroll, Burt H. Book review of *Structure et Propriétés des Couches Photographiques* by L. P. Clerc—545

Carswell, W. E. Two methods of determining a recognizable relationship between areas of color, related to both Munsell and Ostwald—265(A)
Catalán, Miguel A. and Rafael Velasco. Changes in g-values, in a spectrum, for different magnetic fields—653
Chalklin, F. C. (see Worsnap, B. L.)—790
Chandler, Alfred B. Spectrographic determination of high hafnium in hafnium-zirconium dioxide—262(A)
Chapman, Marian Holmes (see Middleton, W. E. Knowles)—795(A)
Cheydleur, B. F. (see Oldham, Max S.)—544(L)
Clapper, Franklin R. (see Williams, Franklin C.)—796(A)
Clark, Mason E. (see Fisher, Russell A.)—255(A)
Clerc, L. P. *Structure et Propriétés des Couches Photographiques* (Book). Reviewed by Burt H. Carroll—545
Cleveland, E. Lynn and Richard C. Raymond. Light scattering by layered distributions of small metal spheres—795(A)
Code, A. D. (see Hiltner, W. A.)—149
Coleman, Howard S. and Ralph G. Allen. Optical constants of metallic films—261(A)
—— **and Harold E. Rosenberger.** Attenuation of brightness contrast caused by atmospheric optical haze—507
—— **and Harold E. Rosenberger.** Comparison of visual and photoelectric measurements of the attenuation of brightness contrast by the atmosphere—371
—— **and Harold E. Rosenberger.** Effect of wave-length on the attenuation of brightness contrast by the atmosphere —263(A)
Colthup, N. B. Spectra-structure correlations in the infra-red region—397
Combes, Lewis S. (see Ballard, Stanley S.)—798(A)
—— **and Stanley S. Ballard.** Studies of the inelastic behavior of optical crystals—256(A)
Convey, J. and J. K. Hurwitz. Analysis of the excitation characteristics of spectra emitted by ferrous alloys—803(A)
Corley, Richard S. (see Blout, Elkan R.)—415
Coulston, J. G. (see Guest, P. G.)—787(L)
Covell, William (see O'Brien, Brian)—260(A)
Curcio, J. A., H. S. Stewart, and C. C. Petty. Determination of flame temperature from the OH emission—264(A)
Cutting, Theodore A. *Manual of Spectroscopy* (Book). Reviewed by Wallace R. Brode—181

Dangl, R. J. (see Randall, H. M.)—252
Davidson, H. R. Calculation of subtractive color mixtures—230
—— Visual sensitivity to surface color differences—797(A)
——, **I. H. Godlove, J. M. Lambert, and G. J. Wright.** Illuminant-converting filter for use with the automatic tristimulus integrator—817
de Beauregard, O. Costa. *La Theorié de la Relativité Restreinte* (Book). Reviewed by Max Herzberger—252
deBretteville, A., Jr. Properties of large barium titanate crystals—796(T)
Delaney, J. C. Galvanometer scale for the direct reading of intensities—787(L)
Desvignes, F. (see Terrien, J.)—845
DeVore, J. R. Refractive indices of rutile and sphalerite—266(A)
Dieke, G. H. and A. B. F. Duncan. *Spectroscopic Properties of Uranium Compounds* (Book). Reviewed by D. L. Timma—181
di Francia, G. Toraldo. Parageometrical optics—600
Dimmick, Forrest L. (see Morris, Ailene)—795(A)
Dixon, E. O. (see MacNeille, S. M.)—261(A)
Draisin, W. (see Billings, B. H.)—262(A)
Duncan, A. B. F. (see Dieke, G. H.)—181
Dunkelman, Lawrence (see Baum, William A.)—782
—— **and Charles Lock.** Ultraviolet spectral sensitivity characteristics of photo-multipliers having quartz and glass envelopes—264(A)
Duntley, Seibert Q. Reflectance of submerged objects—795(A)
Durie, D. S. L. Refractive indices of lithium fluoride—878(L)
Dwyer, Robert J. Variable frequency electronic interrupter for the direct current arc—180(L)

Eberhardt, W. H. Slit-width effects in spectrophotometry—172
Eisen, Fred C. (see Wolfe, Robert N.)—143
Elby, F. P. Comatic aberration in infra-red spectrometer design—256(A)/450
Ellis, Joseph W. and Leonard Glatt. Channeled infra-red spectra produced by birefringent crystals—141
Elving, Philip J. Book review of *Physical Methods in Chemical Analysis* by Walter G. Berl—792
Epstein, L. Ivan. Calculation of third-order aberrations with the aid of IBM machines—255(A)
—— Edge-effect in phase contrast—803(A)
—— Extension of Toraldo's theory of phase contrast. I—291
—— **and Donald R. Herriott.** Extension of Toraldo's theory of phase contrast. II—576
Eros, Stephen. Fluorescent lamp spiralling—805(A)
Evans, J. C. and T. A. King. Five-inch molded silver chloride correctors for Kellner-Schmidt system—799(A)
Evans, Ralph M. Book review of *Color Pyschology and Color Therapy* by Faber Birren—696

Fabritus, George. Lamp quality optical inspection equipment —794(T)
Farnsworth, Dean (see Judd, Deane B.)—833
Fassel, Velmer A. and Charles H. Anderson. Quantitative spectrographic analysis of zirconium-hafnium mixtures—803(A)/742
Fastie, William G. Ambient temperature independent thermopiles for radiation pyrometry—805(A)
—— Small plane grating monochromator—800(A)
Feder, Donald P. Method of tracing skew rays—255(A)
Ferguson, W. F. C. (see Greig, J. H.)—504
Fetterley, G. H. and W. M. Hazel. D.c. arc source and automatic controller—76
Feynman, Richard P. Role of quanta in ordinary optical phenomena—261(T)
Finkelstein, N. A. Efficient grating mounting—800(A)
—— Integrating sphere for reflectance measurements in the ultraviolet—178(L)
Fisher, Russell A., William C. Knopf, and Mason E. Clark. Iron arc spectrum between 1.2 and 2.0 microns—255(A)
Fister, Harold J. *Manual of Standardized Procedures for Spectrophotometric Chemistry* (Book). Reviewed by Wallace R. Brode—880
Fleck, Horst (see Haber, Heinz)—459
Fochs, P. D. Method of determining concurrently the thickness and refractive index of a thin film or lamina—623(L)
Fonda, Gorton R. Dependence of emission spectra of phosphors upon activator concentration and temperature—347
Fortmiller, L., T. H. James, R. F. Quirk, and W. Vanselow. Combined effect of infra-red radiation and intensification upon the photographic latent image—487
Foss, Carl E. (see Granville, Walter C.)—265(A)
Foster, L. V. Microscope optics—275
Fowler, R. G. (see Randall, H. M.)—252
Frerichs, Rudolf. On the relations between crystal counters and crystal phosphors—219
Fry, D. L. (see Mansfield, W. O., Jr.)—804(A)
Fry, Glenn A. Effect of chromatic aberration on the blurredness of the retinal image—796(A)
Fuhrmeister, J. C. (see Mansfield, W. O., Jr.)—804(A)
Fuson, Nelson (see Randall, H. M.)—252

Gardner, Irvine C. New resolving power test chart—257(A)
—— Book review of *Die Brechzahlen einiger Halogenidkristalle* (*The Refractive Indices of Halogen Salt Crystals*) by H. Harting—477
—— Book review of *Die Optik in der Feinmesztechnik* by Karl Räntsch—28
—— **and Clarence H. Hahner.** Research and development in applied optics and optical glass at the National Bureau of Standards—251(N)
Garlick, G. F. J. *Luminescent Materials* (Book). Reviewed by Ferd E. Williams—406
——**and A. F. Gibson.** Errata: The luminescence of photoconducting phosphors—79
Gatterer, Alois and Joseph Junkes. *Atlas der Restlinien* (Book). Reviewed by William F. Meggers—695
Geissbuhler, John O. Design consideration for sealed-beam type lamps—805(A)
Gergely, György. Rise and decay of willemite luminescence—356
Gibb, Thomas R. P., Jr. Book review of *Analytical Absorption Spectroscopy* by M. G. Mellon—695
Gibson, A. F. (see Garlick, G. F. J.)—79
Gibson, Kasson S. and Marion A. Belknap. Permanence of glass standards of spectral transmittance—435
Gill, J. F. (see Teago, F. J.)—477
Ginther, Robert J. (see Schulman, James H.)—337(L), 854
Gilles, A. (see Bauple, R.)—788(L)
Givens, M. Parker and Walter P. Siegmund. Absorption of selenium in the extreme ultraviolet—804(A)
Glasser, L. G. (see Troy, D. J., Jr.)—80
Glatt, Leonard (see Ellis, Joseph W.)—141
Gliddon, Gordon H. Book review of *Optique Physiologique: Volume II. Lumière et Couleurs* by Yves Le Grand—620
Godlove, I. H. Color change from daylight to night light, calculated and observed—797(A)
—— (see Davidson, H. R.)—817
—— (see Granville, Walter C.)—265(A)
Golay, Marcel J. E. Panoramic display of far infra-red spectra—801(A)
—— System of static multislit spectrometer—257(A)
Gold, Louis. On the effect of slit dimensions on collimated beam intensity—119(L)
Goldmark, Peter C. Visual aspects of the CBS color television system—263(T)
Goldstein, Emmanuel. Measurement of fluctuating radiation components in the sky and atmosphere—795(A)
Gordon, G. and W. M. Cady. Apparatus for time-resolved spectroscopy—852
Goren, Mayer B. Simple method for evaluation of atomic and ionic ground states—74
Granville, Walter C., Carl E. Foss, and I. H. Godlove. Color harmony manual: colorimetric analysis of third edition—265(A)
Green, Milton. On the equation of the characteristic curve of photographic emulsions—266(A)
—— Three-line method of obtaining characteristic curves for heterochromous photometry—842
—— **and M. Ritter.** Measurement of reciprocity failure with the log*D* preliminary curve—799(A)
Greenfield, M. A. and F. W. Brown. Calculation of index of refraction of gases from absorption data—643
Greig, J. H. and W. F. C. Ferguson. New mounting for an echelette diffraction grating—504
Grey, David S. New series of microscope objectives. III. Ultraviolet objectives of intermediate numerical aperture—283
—— (see Blout, Elkan R.)—304
Griffin, Paul M. and J. Rand McNally, Jr. Interferometric investigation of Ca and Hg—262(A)
Griffith, Grace E. Position of the bands of Fabry Perot type filters as a function of angle of incidence—261(A)
Grodsky, Vladimir. Bronze glass molds replacing cast iron glass molds—177(L)
Guest, P. G. and J. G. Coulston. Fresnel interference in the Michelson interferometer—787(L)
Guth, S. K. Brightness relationships for comfortable seeing—794(T)

Haber, Heinz. Torus grating—153
—— **and Horst Fleck.** Color saturation threshold meter—459
Hahner, Clarence H. (see Gardner, Irvine C.)—351(N)
Halwer, M. (see Brice, B. A.)—768
Hammond, Harry K., III and Isadore Nimeroff. Measurement of 60° specular gloss—265(A)
Hamsher, D. H. (see Nelson, C. N.)—863
Hanson, W. T., Jr. Color correction with colored couplers—166
Hardy, Arthur C. and F. Mansfield Young. Colorimetry by abridged spectrophotometry—59(L)
Harriman, M. W. and S. B. Williams. Visibility on cathode-ray tube screens: positive *vs.* negative signals on an intensity modulated scope—102
Harris, Clyde W. Optical design by a matrix method—819
Harris, Louis and John K. Beasley. Theory for the infra-red absorption of gold blacks—801(A)
——, **John K. Beasley, and Arthur L. Loeb.** Reflection and transmission of radiation by metal films and the influence of non-absorbing backings—801(A)
Harrison, George R. Retrogression in spectroscopy—127
—— Book review of *Photoelectricity and Its Application* by V. K. Zworykin and E. G. Ramberg—28
—— **and James E. Archer.** Rapid interferometric calibration of precision screws—259(A)
——, **Edward H. Jacobsen, and Jean Camus.** Automatic control of groove straightness in grating ruling—800(A)
Harting, H. *Die Brechzahlen einiger Halogenidkristalle* (*The Refractive Indices of Halogen Salt Crystals*) (Book). Reviewed by Irvine C. Gardner—477
Harvalik, Zaboj V. and John H. Bowen. Subjective spectral band limits under controlled conditions—755
Harvey, Charles E. *Spectrochemical Procedures* (Book). Reviewed by Wallace R. Brode—696
—— (see Hasler, M. F.)—262(A)
Hasler, M. F. Quantometry in 1950—804(A)
—— **and C. E. Harvey.** Spectrochemical methods of brass analysis—262(A)
Hass, Georg (see Benson, Nels C.)—687
Haupt, Geraldine Walker. Potassium chromate standard of spectral transmittancy for the ultraviolet—802(A)
Hazel, W. M. (see Fetterley, G. H.)—76
Herriott, Donald R. (see Epstein, L. Ivan)—576
Herzberger, Max. Optical model of physics—424
—— Book review of *La Theorie de la Relativité Restreinte* by O. Costa de Beauregard—252
Hetényi, M. *Handbook of Experimental Stress Analysis* (Book). Reviewed by Samuel Levy—880
Higgins, G. C. (see Jones, L. A.)—799(A)
—— **and K. Stultz.** Variation of visual acuity with various test-object orientations and viewing conditions—135
Hiltner, W. A. and A. D. Code. Compensation for seeing in stellar photoelectric spectrophotometry—149
Hodge, Edwin S. (see Schoen, A. L.)—23
Hoerlin, Herman and F. W. H. Mueller. Gold sensitization of x-ray films—266(A)/246
Holbourn, A. H. S. Production of diffraction gratings—59(L)
Holden, Robert B., William J. Taylor, and Herrick L. Johnston. Variable thickness low temperature infra-red cell—757
Holland, Dan H. (see Peterson, E. W.)—253(L)
Hopkins, Robert E. and Louise Rivoli. Lens for Institute of Optics' high speed camera—256(A)
—— **and Louise Rivoli.** Study of telescope refracting objectives—802(A)

Hornig, D. F., G. E. Hyde, and W. A. Adcock. Ratio-recording double-beam infra-red spectrophotometer with automatic slit-control—497
Hotchkiss, Robert N., Francis E. Washer, and Fred W. Rosberry. Spurious resolution of photographic lenses—802(A)
Hoyt, G. D. and W. W. McCormick. Study of the short duration, high intensity, electric arc as a source of visible light—658
Hughes, Harold K., (see Murphy, Robert W.)—259(A)/779
Humez, David E. Close temperature control of a large room—800(A)
—— New recording comparison microphotometer—802(A)
Humphreys, Curtis J. Extensions to the infra-red emission spectrum of mercury—255(A)
—— Book review of *Infrared Radiation Therapy Sources and Their Analysis with Scanner* by Leopold Rovner—545
—— **and Henry J. Kostkowski.** Infra-red emission spectrum of vanadium—801(A)
Hunt, R. W. G. Effects of daylight and tungsten light-adaptation on color perception—362
Hunter, Richard S. New goniophotometer—265(A)
—— (see Nickerson, Dorothy)—263(A)/446
Hurwitz, J. K. (see Convey, J.)—803(A)
Hyde, G. E. (see Hornig, D. F.)—497

Ishiguro, Kozo. Phase-shift measurement of thin films and its amplification—789(L)
Ives, Herbert E. Extrapolation from the Michelson-Morley experiment—185

Jackson, L. C. *Wave Filters* (Book). Reviewed by J. Rand McNally, Jr.—790
Jacobs, John E. Performance of cadmium sulfide as a detector of x-radiation—798(A)
Jacobsen, Edward H. (see Harrison, George R.)—800(A)
Jaffe, Halina (see Jaffe, Joseph H.)—53
Jaffe, Hans. Optical aspects of piezoelectric crystals—795(T)
Jaffe, Joseph H. and Halina Jaffe. Measurement of thickness of infra-red absorption cells—53
James, R. W. *X-Ray Crystallography* (Book). Reviewed by J. Rand McNally, Jr.—790
James, T. H. (see Fortmiller, L.)—487
Jarrell, Richard F. (see McNally, Fred A.)—800(A)
Johnson, F. S. (see Tousey, R.)—264(A)
—— **and R. Tousey.** Fluorescence sensitized photo-multipliers for the measurement of vacuum ultraviolet radiation—264(A)
Johnson, Peter D. and Frank J. Studer. Reflectance as a measure of absorption in solid crystalline materials—121(L)
Johnson, R. C. *Atomic Spectra* (Book). Reviewed by J. Rand McNally, Jr.—790
Johnston, Herrick L. (see Holden, Robert B.)—757
Jones, L. A. and G. C. Higgins. Photographic granularity and graininess. V. A variable magnification instrument for measuring graininess: structural and performance characteristics—799(A)
Jones, R. Clark. Reversibility and irreversibility of optics, or, is optics possible—798(T)
—— Trapping of light in fluorescent bodies—261(A)
Judd, Deane B. Errata: A comparison of direct colorimetry of titanium pigments with their indirect colorimetry based on spectrophotometry and a standard observer—52
—— Book review of *Language of Drawing and Painting* by Arthur Pope—28
——, **Lorenzo Plaza, and Dean Farnsworth.** Tritanopia with abnormally heavy ocular pigmentation—833
Junkes, Joseph (see Gatterer, Alois)—695
Jurmain, J. and D. E. Williamson. Analog computer for spectrographic analysis of high alloys—804(A)

Kagarise, R. E. (see Rank, D. H.)—89
Keller, Herbert B. (see Keller, Joseph B.)—48
Keller, Joseph B. and Herbert B. Keller. Determination of reflected and transmitted fields by geometrical optics—48
Kessler, Karl G. (see Meggers, William F.)—737
Kiess, C. C. Comment on "Spark spectra of elements 43 and 61"—177(L)
King, T. A. (see Evans, J. C.)—799(A)
Kirk, Paul L. *Quantitative Ultramicroanalysis* (Book). Reviewed by Wallace R. Brode—620
Kivenson, Gilbert. Some considerations in the design of double-beam analyzers for industrial control—112
Kjellgren, Bengt. Some experiences in the production of large clear crystals from solutions—795(T)
Klein, Myron W. (see Smakula, Alexander)—799(A)/748
Klick, Clifford C. (see Schulman, James H.)—337(L), 622(L), 854
—— **and James H. Schulman.** Existence of "sub-bands" in the luminescence emission spectrum of manganese activated zinc silicate—509
Knopf, William C. (see Fisher, Russell A.)—255(A)
Kostkowski, Henry J. (see Humphreys, Curtis J.)—801(A)
Kowalewski, Dora G. and Valdemar J. Kowalewski. On a method for the calibration of photographic emulsions—621(L)
Kowalewski, Valdemar J. (see Kowalewski, Dora G.)—621(L)
Kraushaar, R. Diffraction grating interferometer—480(L)
Kremers, H. C. Growing optical crystals from the fused melt—795(T)
Kubota, Hiroshi. On the interference color of thin layers on glass surface—146
—— On sensitive color—621(L)

Lamb, Mary A. (see Plyler, Earle K.)—255(A)
Lambert, J. M. (see Davidson, H. R.)—817
Land, E. H., G. Bird, and W. A. Shurcliff. Detection of tracks and stars in nuclear track plates—61
Langton, William G. Baird Associates ruling engine—258(A)
Lee, George Hamor. *Introduction to Experimental Stress Analysis* (Book). Reviewed by Walter Ramberg—790
Le Grand, Yves. *Optique Physiologique: Volume II. Lumière et Couleurs* (Book). Reviewed by Gordon H. Gliddon—620
Leibhardt, Edward. Dividing gear for a ruling engine—623(L)
Leverenz, H. W. *An Introduction to Luminescence of Solids* (Book). Reviewed by W. R. Brode—406
Leininger, R. K. Spectrochemical determination of major constituents of limestone—804(A)
Levy, Samuel. Book review of *Handbook of Experimental Stress Analysis* by M. Hetényi—880
Liston, Max D. (see White, John U.)—29, 93
——**and John U. White.** Amplification and electrical systems for a double beam recording infra-red spectrophotometer—36
Lock, Charles (see Dunkelman, Lawrence—264(A)
—— (see Packer, D. M.)—264(A)
Loeb, Arthur L. (see Harris, Louis)—801(A)
Longwell, Jean (see Burns, Keivin)—339
Lonsdale, Kathleen. *Crystals and X-Rays* (Book). Reviewed by A. L. Patterson—181
Loofbourow, John R. Microspectroscopy—317
—— (see Vallee, Bert L.)—803(A)/751
Lord, R. C. and E. Nielsen. Apparatus for low temperature study of the Raman effect—255(A)/655
Luneburg, Rudolf K. Metric of binocular visual space—627
Lyon, Donald W. and E. Louise Poore. Some new infra-red phosphors—179(L)

MacAdam, David L. Loci of constant hue and brightness determined with various surrounding colors—264(A)/589
—— Maximum attainable luminous efficiency of various chromaticities—120(L)

—— Method of colorimetric integration using punched-card accounting machines—138
—— Should an American revision of the ICI colorimetry data be proposed?—798(A)
Macdonald, Duncan E. Criteria for detection and recognition of photographic detail—258(A)
——, **Grant D. Ross, and William W. Tunnicliffe.** Video techniques in aerial reconnaissance—263(A)
Mack, J. E. (see Arroe, O. H.)—386
MacNeille, S. M. and E. O. Dixon. Electrical computer for calculating the optical properties of multilayer interference films—261(A)
Mahan, A. I. and E. E. Price. Diffraction pattern deterioration by roof prisms—664
Mandelker, Jakob. *Principles of a New Energy Mechanics* (Book). Reviewed by Hans Mueller—181
Mansfield, W. O., Jr., J. C. Fuhrmeister, and D. L. Fry. Spectrographic determination of the halogens and sulfur in engine deposits—804(A)
Marcus, Bernard. Lens testing bench—257(A)
Marechal, A. Coherent set of tolerances for geometrical aberrations, including excentration effects—60(L)
Marton, L. Electron *vs.* photons: a comparison of microscopes 269
—— Book review of *Electron Microscopy: Techniques and Applications* by R. W. G. Wyckoff—879
Matossi, F. (see Oldham, Max S.)—544(L)
—— Book review of *Elektronenoptik I, Grundzüge der theoretischen Elektronenoptik* by Alexander A. Rusterholz—879
—— Book review of *The Electron Microscope, its Development, Present Performance and Future Possibilities* by D. Gabor—879
Mayo, Eleanor G. (see Middleton, W. E. Knowles)—805(A)
Mazumder, K. C. Cadmium spectra—120(L)
McCarthy, Kathryn A. (see Ballard, Stanley S.)—798(A)
—— **and Stanley S. Ballard.** Measurements of the thermal conductivity of optical crystals—256(A)
McCormick, W. W. (see Hoyt, G. D.)—658
McCubbin, T. King, Jr. and William M. Sinton. Recent investigations in the far infra-red—254(A)/537
McMahon, H. O. Thermal radiation from partially transparent reflecting bodies—376
McNally, Fred A. and Richard F. Jarrell. Concave replica grating results—800(A)
McNally, J. Rand, Jr. (see Griffin, Paul M.)—262(A)
——(see Smith, D. D.)—803(A), 878(L)
——(see Stukenbroeker, George L.)—262(A), 336(L)
—— Book review of *Applications of Interferometry* by W. E. Williams—790
—— Book review of *Atomic Spectra* by R. C. Johnson—790
—— Book review of *Electron Diffraction* by R. Beeching—477
—— Book review of *Hyperfine Structure in Line Spectra and Nuclear Spin* by S. Tolansky—477
—— Book review of *Mercury Arcs* by F. J. Teago and J. F. Gill—477
—— Book review of *Metre-Kilogram-Second System of Electrical Units* by R. K. Sas and F. B. Pidduck—477
—— Book review of *Wave Filters* by L. C. Jackson—790
—— Book review of *X-Ray Crystallography* by R. W. James —790
—— Book review of *X-Ray Optics* by A. J. C. Wilson—477
—— Book review of *X-Rays* by B. L. Worsnap and F. C. Chalklin—790
—— **and G. L. Stukenbroeker.** Spectrum shifts for thorium isotopes—803(A)
Medveson, L. T. Halftone masking theory from Neugebauer equations—796(A)
Meggers, William F. Book review of *Atlas der Restlinien* by Alois Gatterer and Joseph Junkes—695
—— **and Karl G. Kessler.** Wave-lengths of mercury 198—801(A)/737
——, **B. F. Scribner, and W. R. Bozman.** Absorption and emission spectra of promethium—262(A)
Mellon, M. G. *Analytical Absorption Spectroscopy* (Book). Reviewed by Thomas R. P. Gibb, Jr.—695
Meltzer, Robert J. Resolving power of infra-red prism spectrometers—257(A)
Menzel, Donald H. Book review of *Stellar Evolution* by Otto Struve—791
Meyer, D. R. (see Mote, F. A.)—584
Middleton, W. E. Knowles. Colors of distant objects—263(A)/373
—— Curve computer—263(A)
—— **and Marian Holmes Chapman.** Investigators on meteorological estimates of the visual range—795(A)
—— **and Eleanor G. Mayo.** Variation in horizontal distribution of light from candlepower standards—805(A)
Millson, Henry E., Jr. (see Millson, Henry E.)—430
Millson, Henry E. and Henry E. Millson, Jr. Observations on exceptional duration of mineral phosphorescence—430
Milne, Gordon G. New reciprocity failure in photographic exposure at high intensity—799(A)
—— (see O'Brien, Brian)—260(A)
Moore, Charlotte E. Book review of *Hydrogen in Chemical Atoms* by William Mayo Venable—696
Morris, Ailene and Forrest L. Dimmick. Visual acuity at very low levels of illumination—795(A)
Moss, T. S. Ultimate limits of sensitivity of lead sulfide and telluride photo-conductive detectors—602
Mote, F. A., A. J. Riopelle, and D. R. Meyer. Effect of intermittent preadapting light upon subsequent dark adaptation in the human eye—584
Mueller, F. W. H. (see Hoerlin, Herman)—266(A)/246
Mueller, Hans. Book review of *Principles of a New Energy Mechanics* by Jakob Mandelker—181
Mundie, L. G. (see Oldham, Max S.)—544(L)
Murphy, Robert W. and Harold K. Hughes. Simultaneous recording of two wave-length ranges with the Littrow spectrograph—259(A)/779
Murray, Allen E. Effect of antireflection films on color in optical instruments—262(A)

Nagel, Max R. Sensitometric effects in motion-blurred negatives—799(A)
Nagy, Elemér. Emission bands of willemite in phosphorescence —407(L)
Nelson, C. N. and D. H. Hamsher. Photography of high altitude aerial objects—863
Nicholls, R. W. Kinetics of excitation of molecular nitrogen —805(A)
Nickerson, Dorothy. Certain color changes under artifiical lighting—797(A)
—— Munsell renotations used to study color space of Hunter and Adams—85
——, **Richard S. Hunter, and Marshall G. Powell.** New automatic colorimeter for cotton—263(A)/446
Nielsen, E. (see Lord, R. C.)—655
Nielsen, J. Rud (see Richards, Charles M.)—255(A), 438, 442
Nierenberg, Richard N. Unique method of obtaining a uniformly bright area—260(A)
Nimeroff, Isadore (see Hammond, Harry K., III)—265(A)

O'Brien, Brian. Local variations of the Stiles and Crawford effect—796(A)
——, **Gordon G. Milne, and William Covell.** Fast closure slit closure with low inertia—260(A)
——, **Gordon G. Milne, and William Covell.** Improved image dissector for very high speed motion photography—260(A)
O'Brien, Brian, Jr. Spectral sensitivity of photo-sensitive acid resists—799(A)

Oldenberg, O. and H. P. Broida. Application of photoelectric multiplier tubes to the sensitive measurement of absorption of changes of relative light intensities—381
Oldham, Max S., L. G. Mundie, F. Matossi, and B. F. Cheydleur. Method for the determination of optical constants of semitransparent films—544(L)
Opler, Ascher. Spectrophotometry in the presence of stray radiation: a table of log $[(100\text{-}k)/(T\text{-}k)]$—401
Osterberg, Harold. Microscope imagery and interpretations—295
—— **and Gilbert E. Pride.** Effect of particle size on the diffraction image in microscopy with narrow-coned, axial illumination—14
—— **and Gilbert E. Pride.** Measurement of unresolved, single particles of uniform thickness by means of variable phase microscopy—64

Packer, D. M. and C. Lock. Thermocouple measurements of spectra intensities in the vacuum ultraviolet—264(A)
Patterson, A. L. Book review of *Crystals and X-Rays* by Kathleen Lonsdale—181
Perry, J. W. Abridged spectrophotometric colorimetry with photo-cells—119(L)
Peterson, E. W. and Dan H. Holland. On the shape of the sensitive cathode area of electron multiplier photo-tubes—253(L)
Petty, C. C. (see Curcio, J. A.)—264(A)
Pidduck, F. B. (see Sas, R. K.)—477
Plant, W. R. New recording spectroradiometer—805(A)
Plaza, Lorenzo (see Judd, Deane B.)—833
Plyler, Earle K. Infra-red absorption spectra of twelve chlorinated benzenes—801(A)
—— (see Tilton, Leroy W.)—540, 798(A)
—— **and Mary A. Lamb.** Infra-red spectrum of CH_3ClF—255(A)
Poore, E. Louise (see Lyon, Donald W.)—179(L)
Pope, Arthur. *Language of Drawing and Painting* (Book). Reviewed by Deane B. Judd—28
Powell, Marshall G. (see Nickerson, Dorothy)—263(A)/446
Price, E. E. (see Mahan, A. I.)—664
Pride, Gilbert E. (see Osterberg, Harold)—14, 64
Pringsheim, Peter. *Fluorescence and Phosphorescence* (Book). Reviewed by Wallace R. Brode—545
Pryor, Paul L. Military standard on photographic lenses—801(A)

Quarles, Gilford G. *Elementary Photography* (Book). Reviewed by Wallace R. Brode—620
Quirk, R. F. (see Fortmiller, L.)—487

Ramberg, E. G. (see Zworykin, V. K.)—28
Ramberg, Walter. Book review of *Introduction to Experimental Stress Analysis* by George Hamor Lee—790
Randall, H. M., R. G. Fowler, Nelson Fuson, and R. J. Dangl. *Infrared Determination of Organic Structures* (Book). Reviewed by R. Bowling Barnes—252
Rank, D. H. Some high speed spectrograph objectives—256(A)/462
—— **and R. E. Kagarise.** Empirical convergence correction of depolarization measurements—89
Rintsch, Karl. *Die Optik in der Feinmesztechnik* (Book). Reviewed by Irvine C. Gardner—28
Raymond, Richard C. (see Lynn, Cleveland E.)—795(A)
—— (see Walker, Marshall J.)—766
Reimer, Charles B. (see Vallee, Bert L.)—803(A)/751
Rense, William A. Polarization studies of light diffusely reflected from ground and etched glass surfaces—55
Richards, Charles M. and J. Rud Nielsen. Raman spectra of *cis*- and *trans*-2-butene and 1,3-butadiene in the gaseous and liquid states—255(A)
—— **and J. Rud Nielsen.** Raman spectra of *cis*- and *trans*-2-butene in the gaseous and liquid states—442
—— **and J. Rud Nielsen.** Raman spectrum of 1,3-butadiene in the gaseous and liquid states—438
Richardson, David (see Brumley, Corwin H.)—800(A)
——, **R. S. Wiley, and G. J. Sheldon.** Improved diffraction gratings and echelles—259(A)
Richardson, John (see Tousey, R.)—264(A)
Riopelle, A. J. (see Mote, F. A.)—584
Ritter, M. (see Green, M.)—799(A)
Rivoli, Louise (see Hopkins, Robert E.)—256(A), 802(A)
Roberts, Shepard and Ferd E. Williams. Theory of the luminescence of sulfide phosphors—516
Romand, J. (see Bauple, R.)—788(L)
Romer, Alfred, Robert D. Turner, and Irene Comfort Stehli. Wave-lengths of the potassium lines 3446A and 3447A—178(L)
Rosberry, Fred W. (see Hotchkiss, Robert N.)—802(A)
—— (see Washer, Francis E.)—801(A)
Rosenberger, Harold (see Coleman, Howard S.)—263(A), 371, 507
Ross, Grant D. (see Macdonald, Duncan E.)—262(A)
Rouse, Arthur G. New source for spectro-chemical analysis—82
Rovner, Leopold. *Infrared Radiation Therapy Sources and Their Analysis with Scanner* (Book). Reviewed by Curtis J. Humphreys—545
Rozsa, J. T. Spectrochemical analysis of biological leaf material—804(A)
Rupert, C. S. and John Strong. Carbon arc as an infra-red source—455
Russell, Henry Norris. Arc and spark spectra of gadolinium—550
—— Estimation of ionization potentials by comparison with neighboring elements—618
Rusterholz, Alexander A. *Elektronenoptik I, Grundzüge der theoretischen Elektronenoptik* (Book). Reviewed by L. Marton—879

Sage, S. (see Billings, B. H.)—262(A)
Salzberg, Bernard. Propagation of electromagnetic waves through a stratified medium. I.—465
Sas, R. K. and F. B. Pidduck. *Metre-Kilogram-Second System of Electrical Units* (Book). Reviewed by J. Rand McNally Jr.—477
Saunders, James B. Precise topography of optical surfaces—258(A)
Saylor, Charles Proffer, Arthur T. Brice, and F. Zernike. Color phase-contrast microscopy: requirements and applications—329
Scheibner, E. J. (see Schulz, L. G.)—761
Schlegel, Richard. Optical refraction and Fermat's principle at a point—244
Schoen, A. L. and Edwin S. Hodge. Photographing spectra in the vacuum ultraviolet—23
Schulman, James H. Effect of high energy radiation on luminescent properties of crystals and glasses—796(T)
—— (see Klick, Clifford C.)—509
—— **and Clifford C. Klick.** On the fluorescence and phosphorescence emission spectra of manganese-activated zinc silicate—622(L)
——, **Robert J. Ginther, and Clifford C. Klick.** Some optical properties of lead-activated sodium chloride phosphors—854
——, **Clifford C. Klick, and Robert J. Ginther.** Variation of emission spectrum of manganese-activated zinc beryllium silicate with decay time—337(L)
Schulz, L. G. Accurate thickness measurements with a Fabry-Perot interferometer—177(L)
—— Effect of phase changes in white light interferometry—802(A)

—— Interferometric method for accurate thickness measurements of thin evaporated films—690
—— **and E. J. Scheibner.** Experimental study of the change in phase accompanying reflection of light from thin evaporated films—761
Scott, G. D. (see Sennett, R. S.)—203
Scott, Noel W. On increasing the adhesion and durability of optical coatings—804(A)
—— (see Benson, Nels C.)—687
Scribner, B. F. (see Meggers, W. F.)—262(A)
Sears, Francis W. *Optics (Volume III of Principles of Physics Series)* (Book). Reviewed by Wallace R. Brode—252
Seidenberg, Richard L. (see Benford, James R.)—259(A)/314
Sennett, R. S. and G. D. Scott. Structure of evaporated metal films and their optical properties—203
Shankland, R. S. Scientific work of Albert A. Michelson—794(T)
Shea, Ruth C. (see Anslow, Gladys A.)—262(A)
Sheldon, G. J. (see Richardson, David)—259(A)
Shenstone, A. G. Cadmium spectra—121(L)
Shurcliff, W. A. (see Land, E. H.)—61
Siegmund, Walter P. (see Givens, M. Parker)—804(A)
Silverman, S. (see Bullock, B. W.)—257(A)/608
Sinden, R. H. Some consequences of the additivity of luminosities—647
Sinton, William M. (see McCubbin, T. King, Jr.)—254(A)/537
Sloan, Louise L. Comparison of the Nagel anomaloscope and a dichroic filter anomaloscope—41
Smakula, Alexander. Color centers in fused and crystalline quartz—266(A)
—— **and Myron W. Klein.** Influence of optical working on surface structure of plastic crystals—799(A)/748
Smith, D. D. and J. R. McNally, Jr. Isotope shifts for Sm^{144} and Sm^{154}—803(A)
—— **and J. R. McNally, Jr.** Isotope shifts in enhanced samarium isotopes—878(L)
Smith, F. D. and A. F. Turner. Phase shifts in interference filters—261(A)
Smith, Warren J. Comments on "The design of triplet anastigmat lenses of the Taylor type"—406(L)
Snow, Patricia L. (see Blout, Elkan R.)—415
Speiser, R. (see Brice, B. A.)—768
Sponer, H. (see Bass, Arnold M.)—389
Stamm, Robert F. Calibration of differential refractometers 788(L)
Stearns, E. I. (see Buc, G. L.)—336(L)
Steel, W. H. Four-figure method of ray tracing—878(L)
Stehli, Irene Comfort (see Romer, Alfred)—178(L)
Stephens, Robert E. Comments on "The Design of Triplet Anastigmat Lenses of the Taylor Type"—407
——(see Tilton, Leroy W.)—540
Stewart, H. S. (see Curcio, J. A.)—264(A)
Stookey, S. D. Photosensitive glass—265(A)
Strong, John. New Johns Hopkins ruling engine—258(A)
—— (see Rupert, C. S.)—455
Struve, Otto. *Stellar Evolution* (Book). Reviewed by Donald H. Menzel—791
Studer, Frank J. (see Johnson, Peter D.)—121(L)
Stukenbroeker, G. L. (see McNally, J. R., Jr.)—803(A)
—— **and J. R. McNally, Jr.** Hyperfine structure of U^{235}—262(A)
—— **and J. Rand McNally, Jr.** Preliminary results on the spin of U^{235}—336(L)
Stultz, K. (see Higgins, G. C.)—135
Sutherland, G. B. B. M. Recent work on the two forms of diamond—254(T)
Sziklai, George C. Tristimulus photometer—797(A)

Taylor, William J. (see Holden, Robert B.)—577
Teago, F. J. and J. F. Gill, *Mercury Arcs* (Book). Reviewed by J. Rand McNally, Jr.—477
Terrien, J. and F. Desvignes. Photometric separator for precision visual spectrophotometry—845
Thiers, Ralph E. Step-sector for the astigmatic spectrograph—849
Theissing, H. H. Macrodistribution of light scattered by dispersions of spherical dielectric particles—232
Thorington, Luke. Temperature dependence of the emission of an improved manganese-activated magnesium germanate phosphor—260(A)/579
Thorndike, E. M. Wide-angle, underwater camera lens—823
Tilton, Leroy W. and Earle K. Plyler. Refractivity of lithium fluoride with application to the calibration of infra-red spectrometers—798(A)
——, **Earle K. Plyler, and Robert E. Stephens.** Refractive index of silver chloride for visible and infra-red radiant energy—540
Timma, D. L. Book review of *Spectroscopic Properties of Uranium Compounds* by G. H. Dieke and A. B. F. Duncan —181
Tolansky, S. *Hyperfine Structure in Line Spectra and Nuclear Spin* (Book). Reviewed by J. Rand McNally, Jr.—477
Toran, Nestor (see Tousey, R.)—264(A)
Torkington, P. Calibration of infra-red spectrometers—481(L)
Tousey, R. (see Johnson, F. S.)—264(A)
——, **F. S. Johnson, John Richardson, and Nestor Toran.** Monochromator for the vacuum ultraviolet—264(A)
Troy, D. J., Jr. and L. G. Glasser. Reducing stray light errors in the Hunter multipurpose reflectometer—80
Tunnicliffe, William W. (see Macdonald, Duncan E.)—263(A)
Turner, A. F. (see Smith, F. D.)—261(A)
Turner, Robert D. (see Romer, Alfred)—178(L)
Tyler, John E. New photometric device—693

Valasek, Joseph. *Introduction to Theoretical and Experimental Optics* (Book). Reviewed by Wallace R. Brode—182
Vallee, Bert L., Charles B. Reimer, and John R. Loofbourow. Influence of argon, helium, oxygen, and carbon dioxide on emission spectra in the d.c. arc—803(A)/751
van der Velden, H. A. (see Bouman, M. A.)—336(L)
van Heel, A. C. S. High precision measurements with simple equipment—809
Vanselow, W. (see Fortmiller, L.)—487
Velasco, Rafael (see Catalán, Miguel A.)—653
Venable, William Mayo. (*Hydrogen in Chemical Atoms* (Book). Reviewed by Charlotte E. Moore—696
Vodar, B. (see Bauple, R.)—788(L)
von Schelling, Hermann. Method for calculating the effect of filters on color vision—419

Walker, Marshall J. and Richard G. Raymond. Measurement of Faraday effect and Cotton-Mouton effect using transient magnetic and a photo-multiplier-type compensator—266(A)/766
Washer Francis E., (see Hotchkiss, Robert N.)—802(A)
—— **and Fred W. Rosberry.** New resolving power test chart —801(A)
Watson, John T. and William C. Britton. Deterioration of image quality by photographic windows—258(A)
—— **and Vincent Young.** Optical quality in large glass blanks —258(A)
Weaver, K. S. Measurement of photographic transmission density—524
—— On the standard source for low level photometry—60(L)
Webb, J. H. Low intensity reciprocity-law failure in photographic exposure: energy depth of electron traps in latent-image formation; number of quanta required to form the stable sublatent image—3

—— Low intensity reciprocity-law failure in photographic exposure. II. Multiplet-quantum hits in a critical time period—266(A)/197
West, C. D. Polarizer, polarizing beam splitter, and birefringent elements; and some optical systems in which they enter—796(T)
White, John U. Design of a multiple reflection Raman tube—803(A)
—— (see Liston, Max D.)—36
—— **and Max D. Liston.** Construction of a double beam recording infra-red spectrophotometer—29
—— **and Max D. Liston.** Performance of a double-beam recording infra-red spectrophotometer—93
Wiley, R. S. (see Richardson, David)—259(A)
Wilkins, J. Ernest, Jr. Resolving power of a coated objective. II—222
—— Theory of the refractometer—259(A)
Williams, Ferd E. Book review of *Luminescent Materials* by G. F. J. Garlick—406
—— (see Roberts, Shepard)—516
Williams, Franklin C. Objectives and methods of density measurement in sensitometry of color films—104
—— **and Franklin R. Clapper.** Multiple inter-reflections in photographic color prints—796(A)
Williams, H. D. Growing large barium titanate crystals—796(T)
Williams, S. B. (see Harriman, M. W.)—102
Williams, W. E. *Applications of Interferometry* (Book). Reviewed by J. Rand McNally, Jr.—790
Williamson, D. E. (see Jurmain, J.)—804(A)
Wilson, A. J. C. *X-Ray Optics* (Book). Reviewed by J. Rand McNally, Jr.—477
Wolf, Ernst and Michael J. Zigler. Dark adaptation level and size of testfield—211
Wolfe, Robert N. and Fred C. Eisen. Spatial photographic recording of fine interference phenomena—143
Woodruff, J. F. Use of briquetted samples in the spectrochemical analysis of carbon and alloy steels and other metals—192
Woodson, Robert A. Schmidt system aberration investigation—802(A)
Wooters, Glenn. Lens centering in microscope objectives—521
Wormser, Eric M. On the design of wide angle Schmidt optical systems—256(A)/412
Worsnap, B. L. and F. C. Chalklin. *X-Rays* (Book). Reviewed by J. Rand McNally, Jr.—790
Wright, G. J. (see Davidson, H. R.)—817

Young, F. Mansfield (see Hardy, Arthur C.)—59(L)
Young, Vincent (see Watson, John T.)—258(A)
Younkin, S. G. Measurement of small color differences in tomato purees—265(A)/596

Zernike, F. Precision method for measuring small phase differences—326
—— (see Saylor, Charles Proffer)—329
Zigler, Michael (see Wolf, Ernst)—211
Zworykin, V. K. and E. G. Ramberg. *Photoelectricity and Its Application* (Book). Reviewed by George R. Harrison—28

JOURNAL OF THE OPTICAL SOCIETY OF AMERICA VOLUME 40, NUMBER 12 DECEMBER, 1950

Annual Subject Index to Volume 40

Key to Index Use

1. **Subjects,** not titles, have been indexed.

2. **Contents** of papers (and abstracts of papers presented at meetings) have been indexed rather than a word breakdown of the title.

3. Principal subjects are given in **boldface** type. Cross-referenced subjects which should be consulted for a more thorough coverage are given in *italics* after the principal subject.

4. (A), (L), (B), (N), etc. indicate, (A) Abstracts of meeting papers; (L) Letters to the Editor; (B) Book Reviews, and (N) Notes. In the case of abstracts of meeting papers, since several abstracts appear on the same page and often on the same or similar subject, the abstract number is also given. If the paper covered by the abstract has been submitted and published in the same year as the abstract, this has been indicated by a solidus (/) between the abstract notation and the Journal page of the full article, i.e., 264 (A*67*)/589 indicates that the paper described in abstract No. *67* on page 264 has been published in full on page 589.

Book Reviews and Letters to the Editor have not been as thoroughly broken down into subjects but have been confined to principal subjects and separate listings under headings of Book Reviews and Letters to the Editor, which in the former have included authors and reviewers.

5. Subjects have been indexed in subdivisions according to key words with prepositions such as "on," "in," "of," "with," etc. included where essential for euphoneous interpretation, but not affecting the alphabetical arrangement of the principal subject. In many cases, where obvious, these prepositions have been omitted.

Aberration, chromatic, effect on vision—796(A*10*)
comatic, in infra-red spectrometer—256(A*15*)/450
geometrical, coherent set of tolerances for—60(L)
ray tracing calculation of—878(L)
Schmidt system—256(A*10*)/412, 802(A*51*)
third-order, calculated with IBM machines—255(A*9*)
torus grating—153
ultraviolet microscope objectives—283
Absorption (see also *Spectra*)
by free radicals—381
theory of—424
Adaptometers, Hecht-Shlaer, monocular—584
Aerial Reconnaissance, video techniques in—263(A*55*)
Alignment, high precision—809
American Society for Testing Materials, Marburg Lecturer, 1950, Wallace R. Brode—547(N)
meeting, June, 1950—547(N)
Ammonium Dihydrogen Phosphate (ADP), birefringent material in polarization interference filter—262(A*46*)
Anomaloscope, dichroic filter—41
Nagel—41
Applied Optics, research and development at the National Bureau of Standards—251(N)
Astronomy, stellar evolution—791(B)
Atmospheric Optics, attenuation of brightness contrast—263(A*57*)
attenuation of brightness contrast, visual and photoelectric measurements compared—371
color of distant objects—263(A*56*)/373, 883
optical haze—507
radiation fluctuations—795(A*6*)
visual range—795(A*5*)
wave-length effects—263(A*57*)

Atomic Spectra (see *Spectra*)
Attenuation of Contrast, atmospheric—507
visual and photoelectric measurements—371
wave-length effect on—263(A*57*)

Barium Titanate Crystals, production of—796(A*14*)
properties of—796(A*15*)
Beam Interrupters, types of—112
Biological Leaf Material, spectrochemical analysis for—804(A*64*)
Birefringent Layers, in dihydrogen phosphate (ADP and KDP) crystals—798(A*26*)
filter—471
Blackwell, H. Richard
Adolph Lomb Medalist—794
Book Reviews
Analytical Absorption Spectroscopy. Edited by M. G. Mellon. Reviewed by T. R. P. Gibb, Jr.—695(B)
Application of Interferometry. W. E. Williams. Reviewed by J. R. McNally, Jr.—790(B)
Atlas of Spectra (Atlas der Restlinien). A. Gatterer and J. Junkes. Reviewed by W. F. Meggers—695(B)
Atomic Spectra. R. C. Johnson. Reviewed by J. R. McNally, Jr.—790(B)
Color Psychology and Color Therapy. F. Birren. Reviewed by R. M. Evans—696(B)
Crystals and X-Rays. K. Lonsdale. Reviewed by A. L. Patterson—181(B)
Electron Diffraction. R. Beeching. Reviewed by J. R. McNally, Jr.—477(B)
Electron Microscope, Its Development, Present Performance and Future Possibilities. D. Gabor. Reviewed by L. Marton—879(B)
Electron Microscopy: Techniques and Applications. R. W. G. Wyckoff. Reviewed by L. Marton—879(B)
Electron Optics. I. Fundamentals of Theoretical Electron Optics (Electronenoptik. I. Grundzüge der Theoretischen Elektronen-optik). A. A. Rusterholz. Reviewed by L. Marton—879(B)
Elementary Photography. G. Quarles. Reviewed by W. R. Brode—620(B)
Fluorescence and Phosphorescence. P. Pringsheim. Reviewed by W. R. Brode—545(B)
Handbook of Experimental Stress Analysis. M. Hetenyi. Reviewed by S. Levy—880(B)
Hydrogen in Chemical Atoms. W. M. Venable. Reviewed by C. E. Moore—696(B)
Hyperfine Structure in Line Spectra and Nuclear Spin. S. Tolansky. Reviewed by J. R. McNally, Jr.—477(B)
Infrared Determination of Organic Structures. H. M. Randall, R. G. Fowler, N. Fuson, and J. R. Dangl. Reviewed by R. B. Barnes—252(B)
Infrared Radiation Therapy Sources and Their Analysis with Scanner. Leopold Rovner. Reviewed by C. J. Humphreys—545(B)
Introduction to Experimental Stress Analysis. G. H. Lee. Reviewed by W. Ramberg—790(B)
Introduction to Luminescence of Solids. W. Leverenz. Reviewed by W. R. Brode—406(B)
Introduction to Theoretical and Experimental Optics. J. Valasek. Reviewed by W. R. Brode—182(B)
The Language of Drawing and Painting. A. Pope. Reviewed by D. B. Judd—122(B)
Luminescent Materials. G. F. J. Garlick. Reviewed by F. E. Williams—406(B)
Manual of Spectroscopy. T. A. Cutting. Reviewed by W. R. Brode—181(B)
Manual of Standardized Procedures for Spectrophotometric Chemistry. H. J. Fister. Reviewed by W. R. Brode—880(B)
Mercury Arcs. F. J. Teago and J. F. Gill. Reviewed by J. R. McNally, Jr.—477(B)
Metre-Kilogram-Second System of Electrical Units. R. K. Sas and F. B. Pidduck. Reviewed by J. R. McNally, Jr.—477(B)
Optics. F. W. Sears. Reviewed by W. R. Brode—252(B)
Photoelectricity and its Application. V. K. Zworykin and E. G. Ramberg. Reviewed by G. R. Harrison—28(B)
Physical Methods of Chemical Analysis. Vol. I. Edited by W. G. Berl. Reviewed by P. J. Elving—791(B)
Physiological Optics. Volume II. Light and Color (Optique Physiologique. Volume II. Lumiére et Couleurs). Y. Le Grand. Reviewed by G. H. Gliddon—620(B)
Precision Measurements in Optics (Die Optik in der Feinmesztechnik). K. Räntsch. Reviewed by I. C. Gardner—28(B)
Principles of a New Energy Mechanics. J. Mandelker. Reviewed by H. Mueller—181(B)
Quantitative Ultramicroanalysis. P. L. Kirk. Reviewed by W. R. Brode—620(B)
Refractive Indices of Halogen Salt Crystals (Die Brechzahlen einiger Halogenidkristalle). H. Harting. Reviewed by I. C. Gardner—477(B)
Spectrochemical Procedures. C. E. Harvey. Reviewed by W. R. Brode—696(B)
Spectroscopic Properties of Uranium Compounds. G. H. Dieke and A. B. F. Duncan. Reviewed by D. L. Timma—181(B)
Stellar Evolution. O. Struve. Reviewed by D. H. Menzel—791(B)
Structure and Properties of Photographic Emulsions (Structure et Propriétés des Couches Photographiques). L. P. Clerc. Reviewed by B. H. Carroll—545(B)
Theory of Special Relativity (La Théorie de la Relativité Restreinte). O. Costa de Beauregard. Reviewed by M. Herzberger—252(B)
Wave Filters. L. C. Jackson. Reviewed by J. R. McNally, Jr.—790(B)
X-Rays. R. L. Worsnap and F. C. Chalkin. Reviewed by J. R. McNally, Jr.—790(B)
X-Ray Crystallography. R. W. James. Reviewed by J. R. McNally, Jr.—790(B)
X-Ray Optics. A. J. C. Wilson. Reviewed by J. R. McNally, Jr.—477(B)
Bouguer's Law, non-uniform films—263(A*58*)
Brass, spectrochemical analysis of—262(A*53*)
1,3-Butadiene, configuration of, from Raman spectra—255(A*6*)/438

Calcium, isotopes investigated interferometrically—262(A*52*)
Cadmium, spectral analysis of—120(L), 121(L)
Cadmium Sulfate, x-ray detector—798(A*25*)
Carbon Arc (see also *Sources*, *Light Sources*, and *Spectrochemical Analysis*)
infra-red source—455
Cathode Ray Tube, cathode targets—102
grid targets—102
infra-red spectrometer using—257(A*17*)/608
intensity modulated scope—102
phosphor excitation—336
screens, visibility on—102
Cell, infra-red, for low temperature—757
infra-red absorption, thickness measurement—53
Chemical Analysis (see also *Spectrochemical Analysis*)
physical methods of—791(B)
Chlorobenzene, fluorescence of, in near ultraviolet—389
Chlorofluoromethane, infra-red spectra of—255(A*4*)
Collimation, intensity of beam reduced by—119(L)
Color (see also *Colorimetry*)
antireflection films, effect on—262(A*47*)
band width assignment of color—755

Color (continued)
centers in fused and crystalline quartz—266(A*79*)
changes from daylight to night light, calculated and observed—797(A*21*)
changes under artificial lighting—797(A*20*)
chromaticities, luminous efficiency attainable—120(L)
differences, visual sensitivity to—797(A*18*)
discrimination, chromatic surrounding field, effect on—797 (A*19*)
distant objects—263(A*56*)/373, 000
films, sensitometry of—104
half-tone masking theory in—796(A*17*)
harmony manual, colorimetric analysis of—265(A*69*)
illuminant-stable, vision test—793(N)
interference, thin layers on glass surface—146, 883
luminous efficiency of various chromaticities—120(L)
mixture, theory of, and projective geometry—264(A*66*)
mixtures, tristimulus value of—230
Munsell—265(A*68*)
Munsell renotations and color space of Hunter and Adams—85
Neugebauer's Theory in—796(A*17*)
Nicol prisims with thin crystal plate producing—621(L)
perception—620(B)
affected by daylight and tungsten light-adaptation—362
dichroic filter anomaloscope studies—41
Nagel anomaloscope studies—41
pleochroism, infra-red—141
prints, inter-reflections in—796(A*16*)
psychology—696(B)
reproduction with coupler dyes—166
sensitive—621(L)
space of Hunter and Adams, studied by Munsell renotations—85
surrounding, effect on constant hue and brightness loci—264(A*67*)/589
television, CBS—263(A*54*)
tristimulus values calculated—817
tristimulus values of subtractive color mixtures—230
vision affected by filters—419
Colorimeter, new automatic, for cotton—263(A*60*)/446
Colorimetry (see also *Color*)
abridged spectrophotometry—59(L), 119(L)
additive luminosities—647
automatic tristimulus integrator—817
chemical analysis procedures—880(B)
color harmony manual, analysis of—265(A*69*)
constant hue and brightness loci determinations—264 (A*67*)/589
cotton measurements—263(A*60*)/446
gloss measurements—265(A*71*)
Hunter color-difference meter—265(A*70*)/596
Hunter multipurpose reflectometer measurements—80
International Commission on Illumination (I.C.I.), revision of data—798(A*22*)
recommendations—183(E)
tristimulus system, calculation of interference colors—146
conversion into Hunter's and Adams' data—85
integration with punched cards—138
meter, for determining color saturation threshold—459
micro-quantitative—620(B)
National Bureau of Standards Circular on—479(N)
scales, Adam—85
Hunter—85
spectrophotometric, abridged—119(L)
tomato purees, color differences—265(A*70*)/596
tristimulus values, calculation of, based on illuminant approximating illuminant A—817
Color meter, for determining saturation threshold—459
Coma, aberration in infra-red spectrometer—256(A*15*)/450
central, calculation and verification of—521
microscope objective with eccentric or tilted lens—521
ray tracing—878(L)
torus grating—153
Commensurator, precision screws calibrated with—259(A*30*)
Commerce Department Award, Judd, Deane B., recipient of—441(N)
Computers, aberrations, third-order calculated—255(A*9*)
absorbance values in infra-red corrected for stray radiation—401
analog for spectrochemical analysis—804(A*66*)
Cartesian curves—263(A*59*)
colorimetric integration, I.C.I., tristimulus system—138
electrical, calculation of properties of multilayer interference films—261(A*42*)
infra-red absorbance values corrected for stray radiation—401
Corundum, reflection spectra in extreme uv absorption—788(L)
Cotton, color measured with new automatic colorimeter—263(A*60*)/446
Cotton-Mouton Effect, measurement of—266(A*77*)/766
Coupler Dyes, correction of color reproduction—166
Crystals, absorption compared with reflectance data of KBr:Tl—121(L)
ammonium dihydrogen phosphate (ADP), for interferometer—800(A*40*)
barium titanate, production of—796(A*14*)
properties of—796(A*15*)
birefringent, dihydrogen phosphate crystals—798(A*26*)
polarization interference filter—262(A*46*)
production of channeled infra-red spectra—141
rutile—266(A*78*)
counters—219
dihydrogen phosphate type, electro-optic effect in—125
electro-optic effect—225
inelastic behavior—256(A*14*)
infra-red optical, thermal conductivity of—256(A*13*)
lithium fluoride, properties of—798(A*28*)
luminescent properties by radiation—796(A*12*)
optical working of surface of—799(A*29*)/748
phosphors—219
photoelectric properties of—219
piezoelectric—225, 795(A*3*)
polarization—225
potassium bromide, thallium activated, absorption and reflectance—121(L)
production of, from fused melt—795(A*2*)
from solutions—795(A*1*)
quartz, color centers in fused and crystalline—266(A*79*)
reflectance compared with absorption data of KBr:Tl—121(L)
rutile, refractive index of—266(A*78*)
silver chloride, molded Schmidt plate—799(A*30*)
sphalerite, refractive index of—266(A*78*)
symposium on, at Cleveland Meeting 1950—795(A)
thallium bromide-iodide—799(A*29*)/748
uniaxial—225
x-ray detection—798(A*25*)
and x-rays—181(B)
Crystallography, x-ray—790(B)

Diamond, properties of—254(A*1*)
Dielectric Particles, light scattering by—232
Diffraction, alignment measurements by—809
echelette grating, new mounting for—504
electron—477(B)
geometrical aberrations—60(L)
grating interferometer—480(L)
image in microscopy—14

pattern and phase contrast—291
pattern deterioration by roof prisms—664
pattern of coated objective—222
phase difference measured—326
phase microscopy—295
torus grating—153
variable phase microscopy—64
x-ray, from crystals—181(B)
Diffraction Gratings (see *Gratings*)
Diffraction Optics, theory of—424
Densitometer, Densitometry
calibration of photographic emulsions—842
color, analytical—104
pot-opal type—524
sensitometry of color films—104
sphere type—524
Double-Beam Analyzer, infra-red, design of—112
ultraviolet, design of—112
Drawing and Painting—122(B)

Echelles—127
interferometer tests for—259(A*29*)
Editorials
Harrison, Dean George R., retirement as editor—1(E)
International Commission on Illumination Recommendations, 1948—183(E)
Optical Society of America, Society finances—549(E)
Physics Today—2(E), 807(E)
Electrical units, law establishing—663(N)
meter-kilogram-second system—477(B)
Electromagnetic Theory, wave propagation in stratified medium—465
Electron Microscopy—269
Electron Multiplier, photo-tube, sensitive cathode area shape—253(L)
Electron Optics, theory of—269, 879(B)
Emission Spectra (see *Spectra* and *Sources*)
Emission, theory of—424
Errata—686(N)
color, of distant objects—883
interference, of thin layers on glass surface—883
colorimetry, direct and indirect compared—52
films, thin evaporated, on glass—883
Michelson-Morley experiment—883
microscope optics—883
phosphors, photo-conducting—79
photographic emulsions
reciprocity law failure—883
x-ray exposure—883
Excitation, of molecular nitrogen, kinetics of—805(A*76*)
Eye (see *Vision*)

Fabry-Perot, filters—261(A*45*)
interferometer—345
Faraday Effect, measurement of—266(A77)/766
Fermat's Principle, parageometrical optics—600
refraction—244
Films, Metal Films, Thin Films
adhesion of—804(A*68*)
antireflection, and their effect on color—262(A*47*)
evaporated—203
index of refraction of—623(L)
interference colors on glass—146, 883
metallic, and their optical constants—261(A*44*)
multilayer interference of—261(A*42*)
non-uniform and Bouguer's Law—263(A*58*)
optical properties of aluminum, antimony, copper, gold, nickel, palladium, silver—203
phase change in reflection from evaporated metal and dielectric—761
phase shift in—789(L)
reflection and transmission of—807(A*44*)
semi-transparent, determination of optical constants of —544(L)
structure of—203
thickness of—623(L)
thickness measurement by interferometer—690
Filters, color vision—419
electrical wave—790(B)
Fabry-Perot type—261(A*45*)
infra-red transmitting—415
interference—261(A*43*)
interference, influence of angle of incidence—336(L)
interference, transmittance of—336(L)
interference, polarization—262(A*46*)
thallium bromide-iodide—799(A*29*)/748
total reflection, birefringent—471
visible absorbing—415
Flame Temperature, hydroxide emission band in uv—264(A*61*)
Fluorescence (see *Luminescence* and *Phosphors*)
Fluorite, microscope, objective using—283
Fluorobenzene, fluorescence of, in near ultraviolet—389
Foucault Tests, concave mirrors figured by quantitative—258(A*23*)
Free Radicals, intensity changes due to absorption by—381

Garnett Theory—203
Geometrical Optics, aberration, set of tolerances for—60(L)
matrices—819
objectives, high speed spectrograph—256(A*11*)/462
reflected and transmitted field intensity determined by—48
Schmidt system, design of wide angle—256(A*10*)/412
theoretical and experimental—182(B)
theory of—424
Geometry, projective, and theory of colors—264(A*66*)
German Glass Technology Society, meeting, Düsseldorf, June, 1950—548(N)
Glass, luminescent properties by radiation—796(A*12*)
molds for—177(L)
photographic windows and resolution—258(A*25*)
photo-sensitive—265(A*73*)
research at National Bureau of Standards—251(N)
standards of spectral transmittance—435
surfaces, polarization studies of light diffusely reflected from —55
Gold Black, infra-red absorption, theory of—801(A*43*)
Goniophotometers—265(A*72*)
Grain, in photographic emulsion—799(A*31*)
Gratings, concave, replica—800(A*37*)
diffraction, interferometer tests for—259(A*29*)
production of—59(L)
ruling engine for—258(A*27*), 258(A*28*)
echelette diffraction, new mounting for—504
mounting of—800(A*38*)
plane, as monochromator—800(A*36*)
replica of concave—800(A*37*)
ruling control, electronic—800(A*41*)
ruling engine's dividing gear—623
ruling, techniques of—127
torus, auto-imagining, theory of—153
Group for the Advancement of Spectrographic Methods (G.A.M.S.)
meetings—191(N), 372(N)
symposium, Strasbourg—543(N)

Hafnium, spectrochemical determination of, in hafnium-zirconium dioxide—262(A*49*)
Halogens, spectrochemical analysis for—804(A*63*)
Harrison, George R.
Ives Medal Address—127
Ives Medalist, 1949—123

Harrison, George R. (continued)
retirement as editor—1(E)
scientific publications—125
Herschel Effect, photographic latent image—487
Hunter Color-Difference Meter, tomato purees—265(A*70*)/596
Hydroxide Radical, emission band in ultraviolet used in flame temperature determinations—264(A*61*)

Illuminating Engineering Society
Gold Medal Award, 1950, William F. Little recipient—793(N)
meeting, 1950—793(N)
new officers, 1951—793(N)
Image, deterioration by photographic plate glass windows—258(A*25*)
Image Dissector, high speed motion photography—260(A*37*)
Infra-Red Absorption Cells, thickness measured—53
Infra-Red (see also *Spectra, Spectrometers*)
absorption of gold black—801(A*43*)
cell, measurement of thickness—53
variable thickness—757
filters, for transmission, region 1 to 6μ—415
heat lamp radiation measured—545(B)
low temperature measurement—757
optical crystals, thermal conductivity of—256(A*13*)
phosphors, sensitive to—335(L)
photo-conductive cells, sensitivity for—603
punch-card committee—547(N)
source, the carbon arc—455
Infra-Red Spectra (see *Spectra*)
Instruments (see also *Colorimeters, Spectrometers,* etc.)
channeled, produced by birefringent crystals—141
differential refractometer—788(L)
galvanometer intensity scale—787(L)
glow discharge arrangement for vacuum evaporator—687
infra-red cells for variable thickness-low temperature—757
monochromatic, with plane grating—800(A*36*)
photometric, flicker—693
photo-multiplier compensator for determination of optical rotation—266(A77)/766
for vacuum evaporated coatings—687
Intensity, measurements in vacuum ultraviolet with thermocouple—264(A*63*)
reduction of beam by collimation—119(L)
Interference, alignment measurements by—809
colors of thin layers on glass surface—146, 883
filters, Fabry-Perot type—261(A*45*)
phase shifts in—261(A*43*)
polarization—262(A*46*)
transmittance of—336(L)
Fresnel, in Michelson interferometer—787(L)
Lloyd mirror, bands produced by—143
Michelson interferometer—787(L)
multilayer, films and their properties calculated by electrical computer—261(A*42*)
phase change on reflection from thin films—761
phase shift measurements of thin films—789(L)
photographic recording of—143
spectra measurements of neon and natural mercury—339
topographic measurements of optical surfaces—258(A*26*)
Interferometer, Interferometry
ammonium dihydrogen phosphate (ADP) crystal for—800(A*40*)
application—790(B)
calcium isotopes studied with—262(A*52*)
diffraction grating—480(L)
electro-optic crystal for—800(A*40*)
Fabry-Perot—345
mercury isotopes studied with—345, 262(A*52*)
Michelson—787(L)
phase changes in white light—802(A*55*)
photometric setting—326
precision screws calibrated by—259(A*30*)
refraction, index of, determined by—623
thickness of infra-red absorption cells measured by—53
thin film, measured by—690
refractive index determined by—623
Inter-Society Color Council, meeting 1950—92(N)
International Commission on Illumination (I.C.I.)
announcement of survey of radiant energy receivers—778(N)
illuminants—797(A*22*), 798(A*23*)
recommendations, 1948—183(E)
revision of colorimetry data, proposal for—798(A*22*)
International Commission of Optics (I.C.O.)
documents available—478(N), 792(N)
London meeting, July, 1950—274(N), 697(N)
proposed standard conditions for experiments in physiological optics—881(N)
report from U.S. National Committee—478(N)
International Optical News
I.C.O. London meeting—697(N)
London Conference on Optical Instruments, July, 1950—698(N)
Iron, arc spectrum of—255(A*3*)
Isotope Shifts—803(A*61*)
in samarium spectrum—803(A*61*)
in thorium spectrum—803(A*62*)
Ives Medal
presentation to George R. Harrison, October, 1949—123
retrogression in spectroscopy, acceptance address by George R. Harrison—127

Jones, Lloyd A., biographical note in PSA Journal—191(N)
Judd, Deane B., receives Commerce Department Medal—441(N)

Kirchhoff's Law extended—376

Lamps, afterglow measurements of ultraviolet radiation from 805(A*75*)
mercury, high pressure, color corrected by magnesium fluorogermanate: manganese activated—260(A*36*)/579
quality, testing of—794
sealed beam, design of—805(A*73*)
spiraling on fluorescent—805(A*74*)
Lenses, blanks tested for optical quality—258(A*24*)
high speed camera of Institute of Optics—256(A*12*)
long focal length, for photography—863
microscope objectives—521
photographic, military, standards for—801(A*48*)
spurious resolution of—802(A*50*)
testing of—257(A*21*)
telescope refracting objectives—802(A*52*)
tester—257(A*21*)
testing bench for photographic objectives—257(A*19*)
triplet anastigmat, of Taylor type—406(L), 407(L)
Letters to the Editor
aberrations, geometrical—60(L)
absorption spectra, quartz and corundum—788(L)
atomic spectra, samarium isotopes—878(L)
chromaticities, luminous efficiency attainable—120(L)
color, sensitive—621(L)
colorimetry, abridged spectrophotometry—59(L), 119(L)
dividing gear for ruling engine—623(L)
electron multiplier photo-tube—253(L)
films, semitransparent, determination of optical constants—544(L)
galvanometer intensity scale—787(L)
glass, bronze molds for—177(L)
gratings, diffraction, production of—59(L)

infra-red spectrometers, calibration of—481(L)
intensity reduction of beam by collimation—119(L)
interference, Fresnel in Michelson interferometer—787(L)
interferometer, diffraction grating—480(L)
lens, triplet anastigmat, of Taylor type—406(L), 407(L)
light source, d.c. intermittent arc—180(L)
luminescence, emission band of willemite—407(L)
emission spectra of manganese-activated zinc silicate—622(L)
infra-red phosphors—179(L)
photographic emulsion, calibration of—621(L)
photometry, standard source for low level—60(L)
ray tracing—878(L)
reflectance, ultraviolet, measurements—178(L)
reflection compared with absorption of solid KBr:Tl—121(L)
refraction, indices of lithium fluoride—878(L)
refractometer, calibration of—788(L)
spectra, cadmium—120(L), 121(L)
potassium, 3446A and 3447A—178(L)
spark, of technetium and promethium—177(L)
spectrophotometry, abridged, colorimetry by—59(L), 119(L)
thin films, determination of thickness and refractive index—623(L)
phase-shift measurement of—789(L)
Light (see also *Radiant Energy* and *Radiation*)
intensity differences measured with photo-multiplier tubes—381
International Commission on Illumination recommendations 1948—183(E)
scattering by small particles—232
speed of—185, 883
Light Sources (see also *Sources* and *Spectra*)
arc, emission spectra—76
d.c. arc, intermittent—180(L)
electric arc—658
flash lamps, gas discharge—648
high pressure xenon arc as ultraviolet source—782
hollow-cathode, for high resolution and small samples—386
mercury arc, for depolarization measurements—89
for photometers—336(L)
short duration, high intensity—658
uniformly bright area—260(A*39*)
variable, in stellar photoelectric spectrophotometry, compensation for—149
Limestone, spectrochemical analysis of—804(A*65*)
Liouville's Theorem, parageometrical optics—600
Lithium Fluoride
calibration of infra-red spectrometers—798(A*27*)
inelastic behavior—256(A*14*)
mechanical properties—798(A*28*)
optical properties—798(A*28*)
refractive index of—798(A*27*), 878(L)
thermal conductivity of—256(A*13*)
Little, William F., I.E.S. Gold Medal Award recipient—793(N)
Lomb, Adolph, Medal (1950)
presented to H. Richard Blackwell—794
Luminance, metacontrast as effected by—796(A*9*)
Luminescence (see also *Phosphors*)
absorption data of KBr:Tl compared with reflectance—121(L)
activator concentration and influence on emission spectra—345
crystal phosphors—219
crystals and glasses, effect of high energy radiation—796(A*12*)
emission spectra, dependence on activator concentration and temperature—345
lead-activated sodium chloride phosphors—854
zinc berylium silicate, manganese activated and decay time—337(L)
excitation of willemite (zinc silicate) by cathode-ray—356
fluorescence, of fluorobenzene and chlorobenzene vapors in the near ultraviolet—389
and phosphorescence—545(B)
and the trapping of light—261(A*40*)
infra-red sensitive, oxy salts—179(L)
phosphors—353
magnesium activated calicum silicate—805(A*75*)
manganese activated zinc silicate phosphor, emission spectrum—509, 622(L)
phosphorescence, duration of, in minerals—430
zinc silicates (willemite)—407(L)
potassium bromide, thallium activated—121(L)
solids, and theory of phosphor absorption—406(B)
inorganic—406(B)
sulfide phosphors, theory of—516
temperature dependence of manganese-activated magnesium germanate phosphor—260(A*36*)/579
temperature effect on emission spectra—345
zinc sulfide type phosphors—260(A*35*)
Luminosity, definition of—647

Mechanics, principles of a new energy—181(B)
In memoriam
Nutting, Perley G.—404
Worthing, Archie G.—404
Mercury
arcs—477(B)
infra-red spectra—255(A*5*)
isotope 198, spectra of—801(A*45*)/737, 345
isotopes investigated interferometrically—262(A*52*)
natural, standards, secondary—339
Metal Films (see *Films*)
Michelson-Morley Experiment, extrapolation of—185, 883
Microphotometer, recording—802(A*54*)
Microscope (see *Microscopy*)
Microscopy, airy limit of resolution—14
dark-field illumination for nuclear track plates—61
designs—275, 883
diffraction, image in—14
electron, comparison with photon—269
course in at Cornell University, August, 1950—454(N)
history and future—879(B)
metal films, study of—203
techniques and applications—879(B)
illumination, narrow-coned axial—14
infra-red—304
lamps for—275, 883
objectives—275, 283, 883
coated to alter diffraction pattern—222
lens centering in—521
optics of—275, 883
particle size effect on diffraction image in—14
phase, resolving power in—295
phase contrast—275, 883
color—329
color plate of fiber glass, sodium chlorate, protozoan, onion root—330
edge effect in—803(A*56*)
opaque specimens—259(A*34*)/314
Toraldo's theory of—291, 576
phase differences, measurement of—326
photon—269
reflected light in phase contrast—259(A*34*)/314
resolution—222
airy limit—14
limits of—295
tests for—275, 883
spectrometry, micro—317

Microscopy, (continued)
stage micrometer, from photographic record of interference bands—144
ultraviolet—275, 883
objectives for—283
variable phase—64
measurement of unresolved single particle—64
Minerals, duration of phosphorescence—430
Mirrors (see also *Films* and *Reflection*)
adhesion of metal films for—804(A*68*)
concave, figured by quantitative Foucault tests—256(A*23*)
Schwarzschild, for microscopic objectives—283
vacuum evaporator for—687
Monochromator (see also *Spectrometers*)
grating, 180 to 4000 mμ—259(A*32*)
plane grating—800(A*36*)
vacuum ultraviolet grating—264(A*62*)

National Bureau of Standards
colorimetry—479(N)
optics and optical glass research—251(N)
spectrographic standards—741(N)
spectrophotometry—479(N)
Neon, standards, secondary—339
Newtonian Relativity—185
Nitrogen, kinetics of excitation of molecules—805(A*76*)
Nomenclature
International Commission on Illumination Recommendations—183(E)
luminosity terminology—647
Nuclear Tracks, microscopic dark-field illumination of plates for—61
photographic emulsions for—61
Nutting, Perley G., in memoriam—404
Nylon, ultraviolet dissociation spectra of—262(A*50*)

Optical Society of America
alphabetical directory of members—699
geographical directory of members—726
local sections news
Chicago section installed—408
meeting, March, 1950—408
News Letter No. 5, February, 1950—191
officers, 1951–52—545
Rochester section history—625
medals
Adolph Lomb Medal to H. Richard Blackwell—794
Frederic Ives Medal to George R. Harrison—123
meetings
March, 1950 (New York)
abstracts of papers presented—254
minutes of meeting of Board of Directors—482
proceedings—254
October, 1950, thirty-fifth annual (Cleveland)—547, 595
abstracts of papers presented—795
minutes of meeting of Board of Directors—882
proceedings—794
March, 1951
advance announcement—692
annual reports for 1949
editor of publications—482
secretary—483
treasurer—485
society finances—549(E)
Optical Society of America, Journal of
binding announcement—418(N)
Optics—252(B)
London conference on, July, 1950—274(N)
microscope—275, 883
theory of—424
in stratified medium—465

Oscillograph (see *Cathode Ray Tube*)

Paint, gloss measurements of —265(A*71*)
Parageometrical Optics—600
Particle, unresolved, optical properties measured by variable phase microscopy—64
Phase Contrast, color—329
edge effect—803(A*56*)
Phase Contrast Microscopy (see *Microscopy*)
Phase Shifts
interference filters—261(A*43*)
Phosphorescence (see *Luminescence, Phosphors*)
Phosphors, calcium silicate, manganese activated—347
crystal
argon, cadmium sulfide, diamond, silver bromide, silver chloride, thallium chloride, and zinc sulfide—219
duration of phosphorescence in natural minerals—430
infra-red sensitive—179(L), 335(L)
double activated—353
magnesium germanate, manganese-activated—260(A*36*)/579
oxygen-containing—179(L)
sodium chloride, lead activated—854
strontium selenide and sulfide, europium-samarium activated—353
strontium sulfide, with zinc, bismuth, and samarium activation—335(L)
sulfide—516
zinc beryllium silicate, manganese activated—337(L), 347
zinc silicate (willemite)—407(L)
cathode-ray excitation—356
manganese activated—509, 622(L), 347
zinc sulfide—260(A*35*)
Photo-Conductive Cells, lead sulfide and telluride, infra-red sensitivity of—603
Photoelectric, colorimeter—119(L)
spectrophotometric compensating control—149
Photoelectricity, application to optical problems—28(B)
Photographic Emulsions (see also *Photography*)
calibration of—266(A*75*), 621(L), 842
color correction with coupler dyes—166
color films—104
development of, and hair-silver formation—615
exposure of—266(A*74*)/197
granularity and graininess, instrument for measuring—799(A*31*)
high altitude—863
high contrast—863
infra-red irradiation of—487
interference bands in, used as stage micrometer for microscope—143
latent image formation—266(A*76*)/246
energy depth of electron traps—3, 883
and Herschel effect—487
low intensity—266(A*74*)/197
multiple quanta in critical time—266(A*74*)/197
nuclear tracks, detection of—61
performance characteristics—799(A*31*)
properties and structure—545(B)
reciprocity law failure—3, 266(A*74*)/197, 799(A*34*), 799(A*35*), 883
recording of fine interference phenomena by—143
silver filaments and dendrites, growth of—615
sublatent image formation—3, 883
for vacuum ultraviolet spectra—23
x-ray, sensitized by gold—266(A*76*)/246
Photographic Flash Lamps
short duration, high intensity gas discharge—658
Photographic Objectives (see *Lenses*)
Photography (see also *Photographic Emulsion*)
color print, inter-reflections in—796(A*16*)

detail, criteria for 258(A22)
elementary—620(B)
filters, color—863
of high altitude objects—863
image dissector for high speed motions—260(A37)
images and their formation—104
lenses, long-focal-length—863
photo-sensitive glass for recording images—265(A73)
shutter for, fast closure slit—260(A38)
Photometer, Photometry
galvanometer intensity scale—787(L)
heterochromous—842
integrating for low light levels—409
interference measurements—326
light source for, used to evaluate slope of absorption curve—336(L)
modulated filament circuit for—693
photoelectric, for turbidimetry—768
recording micro—802(A54)
separator for visual spectrophotometry—845
standard sources for low level—60(L)
tristimulus—797(A22)
Photometric Units established by law—663(N)
Photo-Multipliers, envelopes of, in quartz—264(A54)
fluorescence sensitized—264(A65)
light intensity differences measured by—381
sensitivity to ultraviolet light—264(A64)
vacuum ultraviolet radiation measured by—264(A65)
Photo-Sensitive Receivers, aerial reconnaissance—263(A55)
Photo-Sensitivity, of acid resists—799(A33)
Physical Optics (see also *Geometrical Optics, Optics, Physiological Optics*)
reversibility and irreversibility in—798(A24)
theoretical and experimental—182(B)
Physics Abstracts, 229(N), 646(N)
Physics Today—2(E), 807(E), 765(N)
Physiological Optics (see *Vision*)
Pittsburgh Conference on analytical chemistry and applied spectroscopy—47(N), 844(N)
Plexiglas, inelastic behavior—256(A14)
Polarization, birefringent frustrated total reflection filter—471
crystals, measurements—304
depolarization measurements—89
infrared spectroscopy—141
interference filter—262(A46)
magnetic effects on—266(A77)/766
optical properties entering into—796(A13)
photo-multiplier observation of—266(A77)/766
reflection from dielectric surfaces—55
Potassium, arc spectra of—178(L)
Potassium Chloride, inelastic behavior—256(A14)
Precision Measurements in optics—28(B)
Prisms
Amici roof—664
infra-red spectrometers and resolution—257(A16)
roof, diffraction pattern deterioration by—664
silver chloride, index of refraction for visible and infra-red—540
Promethium (Element 61)
absorption spectra of—262(A48)
emission spectra of—262(A48)
spark spectra of—177(L)

Quanta, optical phenomena—261(A41)
Quantometer—804(A67)
Quartz
absorption spectra of—788(L)
microscope objectives of—283

Radar
cathode-ray tube screens for—102
Radiant Energy, Radiation (see also *Light*)
distribution from candlepower standard—805(A72)
matter and—185
reflection and transmission of metal films and non-absorbing backings—801(A44)
thermal and reflection—376
Radiometry, thermopiles for—805(A71)
Raman Spectra, atlas of—816(N)
1,3-butadiene—255(A6)/438
cis- and *trans-*2-butenes—255(A6)/442
depolarization values of—89
excitation unit for—255(A7)/655
low temperature observations—255(A7)/655
reflection tube for—803(A57)
spectrograph objectives for—462
Ray Tracing, marginal spherical aberration calculated by—878(L)
Reciprocity Law Failure, high intensity photographic exposure—799(A34)
low intensity—3, 266(A74)/197, 883
measurement of—799(A35)
Reflection, absorption of solid KBr:Tl crystals measured by—121(L)
antireflections—262(A47)
electromagnetic theory of—761
filter, total, birefringent—471
geometrical optics method of determining reflected and transmitted field intensity—48
gloss, specular measured—265(A71)
goniophotometer for measurement of—265(A72)
integrating sphere for, in ultraviolet—178(L)
interference filters, Fabry-Perot type—261(A45)
metal-spacer-metal type—261(A43)
metal films—801(A44)
and calculation of their optical constants—261(A44)
multilayer interference films—261(A42)
phase change by thin films—761
polarization studies—55
Raman tube—803(A57)
submerged objects—795(A7)
thermal radiation—376
trapping light in fluorescent materials—261(A40)
Reflectometer, Hunter multipurpose, reduction of stray light in—80
Refraction, birefringent ammonium dihydrogen phosphate in polarization interference filter—262(A46)
birefringent crystals—141
of carbon dioxide—643
of Fermat's principle—244
of halogen salt crystals—477(B)
of lithium fluoride—798(A27), 878(L)
parageometrical—600
refractometer calibration—788(L)
of rutile—266(A78)
of silver chloride—540
skew rays traced by vector method—255(A8)
of sphalerite—266(A78)
of thin films—623(L)
of water vapor—643
Refractometer, differential, calibration of—788(L)
theory of—259(A33)
Relativity, Newtonian—185, 883
physics and—424
special theory of—185, 252(B), 883
Resolution, infra-red microspectrometer—304
measurement of, with test chart—257(A20)
microscopy, limits of—295
objective coated—222
photographic detail detected and recognized—258(A22)
photographic plate glass windows affecting—258(A25)
prism infra-red spectrometers—257(A16)

Resolution, (continued)
spurious, of photographic lenses—802(A*50*)
test chart for—801(A*49*)
Ricco's Law, in vision—336(L)
Röntgen Rays (see *X-Rays*)
Ruling Engine
Baird Associates—258(A*28*)
dividing gear for—623
new Johns Hopkins—258(A*27*)

Samarium (Element 43)
isotope spectral shifts—803(A*61*)
Scattering, of light by small metal spheres—795(A*4*)
Schmidt Optical System, aberration of—802(A*51*)
in astronomy—794
corrector plates of silver chloride—799(A*30*)
Schwarzchild Mirrors, infra-red microspectrometers—304
microscope objectives—283
Screws, precision, interferometric calibration of—259(A*30*)
Selenium, absorption in extreme ultraviolet—804(A*69*)
Sensitometry, effects in motion-blurred negatives—799(A*32*)
Shutter, slit, fast closure with low inertia—260(A*38*)
Silver Chloride, thermal conductivity of—256(A*13*)
Silver Filaments, growth of—615
Skew Rays, tracing of—255(A*8*)
Slit, collimated beam intensity effected by—119(L)
shutter for photography—260(A*38*)
static multislit spectrometer—257(A*18*)
width effects in spectrophotometry—172
Society for Applied Spectroscopy, meeting announcements—73(N), 224(N), 617(N), 816(N)
Sources (see also *Light Sources*)
induction heating, for spectrochemical analysis—82
standard for low level photometry—60(L)
Spectra (see also *Raman Spectra, X-Rays*)
Theory (see also *Atomic* and *Molecular Spectra*)
atomic states, evaluation of—74
g-value change in magnetic fields—653
hyperfine structure—477(B)
ionic ground states, evaluation of—74
ionization potential, estimation of—618
theoretical and experimental—182(B)
torus grating, production by—153
Atomic and Emission
atlas of spectra—695(B)
atomic spectra—790(B)
cadmium, analysis of—120(L), 121(L)
gadolinium, arc and spark—550
hydrogen in chemical atoms—696(B)
hydroxide radical—264(A*61*)
iron arc, 1.2 and 2.0μ—255(A*3*)
mercury, infra-red—255(A*5*)
mercury, natural—339
mercury isotope 198—345, 801(A*45*)/737
neon—339
noble gases, influence on emission spectra—803(A*58*)/751
potassium lines, 3446A and 3447A—178(L)
promethium (element 61)—177(L)
promethium, emission and absorption of—262(A*48*)
samarium isotopes—803(A*61*), 878(L)
technetium (element 43)—177(L)
thorium, isotope shifts of—803(A*62*)
uranium 235, spin in—262(A*51*), 363(L)
vanadium, infra-red emission—801(A*46*)
Molecular, Infra-Red Absorption
ammonia—93, 254(A*2*)/537
androsterone—304
atomsphere—254(A*2*)/537
benzene—93
benzylamine—93
carbon dioxide in breath—93
chlorinated benzenes, absorption of—801(A*42*)
chlorofluoromethane—255(A*4*)
correlated with structure—397
ethylene—93
gold blacks—801(A*43*)
hydrogen chloride—254(A*2*)/537
iso-octane—93
organic structures determined by—252(B)
penicillin in Nujol—93
phenyl alanine—304
polyvinyl alcohol—304
punch card—547(N)
ramie fiber—304
solid substances—254(A*2*)/537
solvent compensation—93
structure correlations—397
thymine—304
tissues, micro-spectra—304
toluene in Nujol—93
Molecular, Ultraviolet, and Visible
corundum absorption—788(L)
Nylon, ultraviolet dissociation—262(A*50*)
quartz absorption, in extreme uv—788(L)
selenium in ultraviolet, absorption of—804(A*69*)
uranium compounds—181(B)
vacuum ultraviolet photography—23
Spectral Sensitivity, photo-sensitive acid resists—799(A*33*)
Spectral Transmission Standards
permanence of—435
potassium chromate as—802(A*53*)
Spectrochemical Analysis, analog computer for—804(A*66*)
analytical absorption spectra—695(B)
biological leaf material—804(A*64*)
brass—262(A*53*)
direct reading "Quantometer"—804(A*67*)
ferrous alloys, influence of excitation characteristics on—803(A*59*)
hafnium in hafnium-zirconium dioxide—262(A*49*)
halogens in engine deposits—804(A*63*)
heterochromous photometry—842
limestone—804(A*65*)
Littrow spectrograph with dual range recording—259(A*31*)/779
metals—192
procedures—696(B)
samples, briquetted—192
sources
d.c. arc, influence of argon, carbon dioxide, helium, and oxygen on—803(A*58*)/751
source for, induction heating—82
standards for, from National Bureau of Standards—741(N)
steel—192
trace impurities—82
zinc base alloys—192
zirconium-hafnium mixtures—803(A*60*)/742
Spectrographs, astigmatic, step-sector for—849
dual range recording with Littrow spectrograph—259(A*31*)/779
modern industrial, course at Boston College, July, 1950—405(N)
objective, high speed—256(A*11*)/462
Spectrometry, Spectrophotometry (see also **Photometry**)
abridged—59(L), 119(L)
chemical analysis procedures—880(B)
color control—119(L)
colorimetry, by abridged—59(L)
filter, illuminant converting—817
infra-red, absorbance values corrected for stray radiation—401
calibration of—481(L)
calibration with lithium fluoride—798(A*27*)

comatic aberration in—256(A*15*)/450
detector: a pin-type thermocouple for amplification system for—36
double-beam recording—93
amplification and electrical systems of—36
construction of—29
micro—304
multislit—801(A*47*)
static—257(A*18*)
noise level in—93
oscillographic recording in near infra-red—257(A*17*)/608
prism, resolving power—257(A*16*)
ratio-recording double-beam—497
stray radiation—401
reduction of, with thallium bromo-iodide—799(A*29*)/748
wave-length calibration in infra-red—93
integrating sphere for reflectance measurements in ultraviolet—178(L)
light source, variable compensation of—149
micro-, quantitative—620(B)
photoelectric, stellar—149
Photoelectric, Group, London Summer School, July, 1950—754(N)
slit-width effects—172
spectral transmittance standards—435
visual, photometric separator for
Spectroradiometer, recording—805(A*70*)
Spectroscopy, astronomical, integrating photometer for—409
d.c. intermittent arc—180(L)
hyperfine structure measurements—386
infra-red source, the carbon arc—455
isotope shift measurements—386
manual of—181(B)
micro—317
resolution increased with hollow cathode source design—386
Standards, candlepower, distribution from—805(A*72*)
mercury 198 as—801(A*45*)/737
military, on photographic lenses—801(A*48*)
potassium chromate as spectral transmission—802(A*53*)
secondary spectral, mercury and neon—339
spectral transmittance, permanence of—435
spectrochemical analysis, National Bureau of Standards—741(N)
Step Sector, astigmatic spectrograph—849
Stray Light, Stray Radiation
absorbance values in infra-red corrected for—401
infra-red absorbance values corrected for—401
reduction of, in Hunter multipurpose reflectometer—80
in infra-red spectrophotometers by thallium bromoiodide—799(A*29*)/748
Stress Analysis, handbook of experimental—880(B)
introduction to experimental—790(B)
Surfaces (Optical)
quality of—258(A*26*)
concave, quality of—258(A*23*)
Symposia, electromagnetic wave propagation, June, 1950—328(N)
molecular structure and spectroscopy (Ohio State University) June, 1950—282(N)

Technetium (Element 43), spark spectra of—177(L)
Technical Publications
Beckman Bulletin—750(N)
Better Analysis—548(N)
Colorimetry—479(N)
absorption analysis—361(N)
Educational Focus—361(N)
Infrared Spectrograms, catalog of—361(N), 750(N)
Illuminant-Stable Color Vision Test—793(N)
Instrument News—361(N)
Optical, glass and optical research at the National Bureau of Standards—251(N)
images, theory of (La Theorie des Images Optiques)—506(N)
Opticians, assembly of (Reunions d'Opticiens)—506(N)
Sensitized materials for scientific and industrial laboratory—548(N)
Spectrographer's News Letter—361(N)
Spectrophotometry—479(N)
Telescopes, refracting objectives for—802(A*52*)
Television, color, CBS—263(A*54*)
Temperature, control for test room—800(A*39*)
Test Chart, for resolving power—801(A*49*)
Thallium Bromide-Chloride, inelastic behavior—256(A*14*)
Thallium Bromide-Iodide, filter for reduction of stray light in infra-red spectrophotometer—799(A*29*)/748
inelastic behavior—256(A*14*)
Thermal Conductivity, crystals used in infra-red optical systems—256(A*13*)
Thin Films (see *Films*)
Thermocouple, vacuum ultraviolet spectral intensities measured by—264(A*63*)
Thermopiles, for radiometry—805(A*71*)
Thorium, isotope spectral shifts—803(A*62*)
Topography, optical surfaces—258(A*26*)
Toraldo's phase contrast theory—291, 576
Transmission, potassium chromate as spectral standard for—802(A*53*)
standards, permanence of—435
Tristimulus, integrator, automatic photometer for—797(A*22*)
Twinkle, fluctuating radiation in sky and atmosphere—795(A*6*)
Turbidimetry, theory and instrumentation—768

Ultraviolet (see also *Spectra* and *Spectrometer*)
measurement of reflectance in—178(L)
microscopy—275
microspectra—317
vacuum, spectra, emulsion for photographing—23
xenon arc as high pressure radiation source—782
Uranium, spectroscopic properties of—181(B)
spin of U^{235}—262(A*51*), 336(L)

Vacuum Ultraviolet, monochromator—264(A*62*)
photographic emulsion for—23
spectral intensities measured with thermocouples—264(A*63*)
Vector, method for tracing skew rays—255(A*8*)
Vision, acuity at low illumination levels.—795(A*8*)
acuity variation with test-object orientation and viewing conditions—135
adaptation and its effect on color perception—362
Alley experiment in—627
binocular space in—627
brightness relationships—794
chromatic aberration effect on—796(A*10*)
color, absorption by intraocular media and macular pigment—419
discrimination affected by chromatic surrounding fields—797(A*19*)
effect of filters on—419
test—793(N)
perception, daylight and tungsten light-adaptation—362
dichroic filter anomaloscope studies—41
Nagel anomaloscope studies—41
cone—825
contrast threshold of the eye—825
dark adaptation level—211
preceded by intermittent preadapting light—584
Fechner's Law, sensation-intensity ratio—647

Vision (continued)
International Commission on Illumination, recommendations, 1948—183(E)
light and color—620(B)
metacontrast—796(A*9*)
multiple stimuli effect on—796(A*9*)
myopia, night—336(L)
non-Euclidian metric for—627
perception of color affected by daylight and tungsten light-adaptation—362
photopic—211
quanta explanation of —336(L)
retired image blurredness—796(A*10*)
retinal properties in—796(A*11*)
rod—825
scotopic—795(A*8*), 211
sensitivity to surface color differences—797(A*18*)
spectral band limits—755
standard conditions, I.C.O. recommendations—881(N)
Stiles and Crawford effect—796(A*11*)
television, CBS color—263(A*54*)
testfield size—211
theories of—620(B)
visibility curve—647
visual range, meteorological estimates of—795(A*5*)
Video, devices in aerial reconnaissance—263(A*55*)
Vanadium, emission spectra in infra-red—801(A*46*)

Worthing, A. G.
in memoriam—404
memorial award—355(N)

X-Rays (Röntgen Rays)—790(B)
cadmium sulfide, detection of—798(A*25*)
crystallography—790(B)
diffraction from crystals—181(B)
optics—477(B)
X-Ray Films, gold sensitization of—266(A*76*)/246

Zeeman Pattern, recording of—127
Zirconium-Hafnium Mixtures, spectrochemical analysis of—803(A*60*)/742